



Positive Train Control

*Meeting the Federal Mandate to Allow
Continued Passenger Operations on the Alaska Railroad*

Quarterly Progress Report October 15, 2013



Representative PTC switch and signal status monitoring equipment for 110 locations.

**This report covers the period:
July 1, 2013 through September 30, 2013**



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Project Summary

There is a federal mandate to install Positive Train Control (PTC), an enhanced safety system to eliminate human factor errors for train and roadway worker operations on all railroads carrying passengers, including the Alaska Railroad (ARRC). PTC is expensive, affects all railroad operations, and is still in development.

PTC was mandated by Congress in 2008, but ARRC has been working since 1996 to develop a PTC system. ARRC is facing a deadline of December 31, 2015 to complete the implementation of PTC. ARRC and most railroads in the lower 48 will not meet the 2015 deadline so we are working with those railroads and Congress to extend the deadline to December 31, 2018. Our budget and plan for this project are based on the 2018 deadline.

The PTC System must reliably prevent the following:

- Train to train collisions.
- Overspeed derailments and incidents.
- Work zone incursions.
- Improper movements over switches and control points.



The PTC System:

There are 5 major segments to the system:

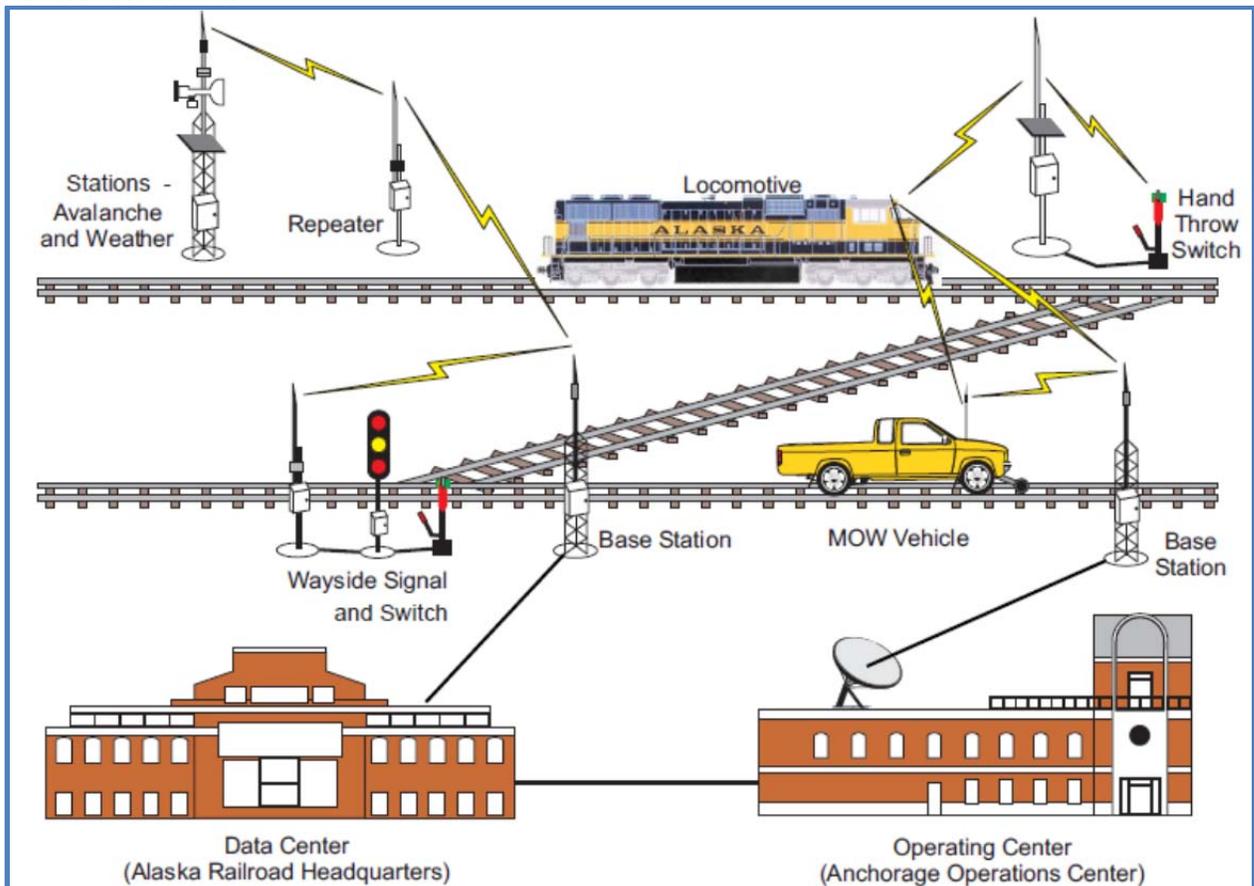
- **Office Systems:** Several sophisticated computer systems control and monitor all railroad movements. These systems are still in development, integration and testing.
- **Locomotive On Board Systems:** Computers, data radios and global positioning system (GPS) are placed on every locomotive and interfaced with the locomotive controls. If a locomotive engineer fails to perform safely, this system will warn the engineer and then proceed to stop the train. Fifty-four ARRC locomotives and cab control cars will need this equipment.
- **Wayside Systems:** Switches are monitored to ensure safe train movement. ARRC will have over 110 switches and 33 signal control points; each will need to communicate with every train or the PTC system will stop the train short of the switch or control point.



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- **Communications Systems:** PTC requires an extensive, sophisticated communications network. A great deal of data must move over microwave and fiber backhaul networks and data radios between the Dispatch Office, the On Board Systems, and the Wayside Systems.
- **System Integration:** All four segments are required to integrate in a fail-safe PTC system to eliminate human factor errors. Fail-safe means that if any failures are detected the system will stop train movements before an incident can occur. In addition to PTC operating in a fail-safe manner, the system is mandated to be highly reliable.

The diagram below illustrates the communication-based PTC interacting with the various segments to allow for safe train movements and maintenance activities on the Alaska Railroad:



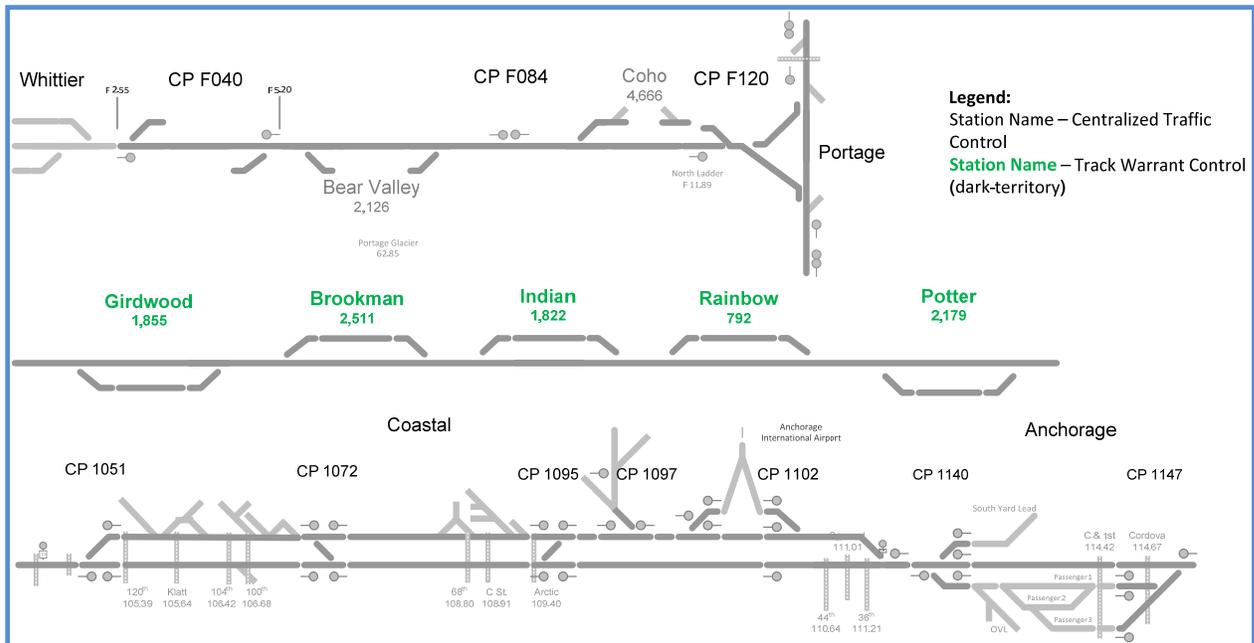
Implementation Strategy

ARRC is implementing a PTC equipped test corridor between Anchorage and Whittier. This will enable testing of the individual PTC system segments and progress to functional testing in a manageable area prior to full deployment for all trains and railroad



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wayside switches and signals. This implementation strategy will allow certain expenditure for the wayside and communication segments to be deferred into future years. The test corridor is shown in the graphic below. The corridor is expected to be ready for testing in the spring of 2014.



Alaska Railroad "Test Corridor" with wayside locations indicated.

Current Status - Quarter Ending September, 2013

ARRC awarded a contract to Wabtec for \$12.1 million for Office components, On Board Systems, and System Integration and issued commitments of \$3.2 million. Wabtec was previously awarded a contract for Computer Aided Dispatch (CAD) which will be integrated as part of this contract to complete the heart of the PTC Office Segment. The Office Segment must be operational for the test corridor testing in 2014. Funding from the State of Alaska in FY 2014 enabled ARRC to award this contract.

ARRC has upgraded and installed wayside and communications systems in the test corridor between Anchorage and Whittier. Ten manual switches now have all PTC-required hardware in place. Software development for the test corridor switches and control points also progressed during the quarter.

Next Quarter Outlook

Next quarter activities include:

- Implement and test PTC software at wayside locations in the test corridor.



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- Prepare Geographic Information System (GIS) data for validation and verification tests within the test corridor. These tests must be witnessed by the Federal Railroad Administration.
- Finish the locomotive on-board equipment installation design and negotiate a final contract for installation.
- Secure required 220 MHz radio frequency licenses.
- Continue design and procurement activities for summer 2014 wayside construction projects.
- Complete testing of the replacement Computer-Aided Dispatch system and perform the cutover after employees are trained.

Alaska Work Force (this quarter)

Alaska Railroad employees (full-time equivalent basis): 15

Alaskan companies providing services:

Supplier

- | | |
|---|-----------|
| • Potelcom Supply Inc: communications supplies | Anchorage |
| • Right Systems: servers | Anchorage |
| • Alaska Battery Mfg.: batteries | Anchorage |
| • Marsh Creek: power systems and design | Anchorage |
| • Airport Equipment Rentals: equipment rental | Anchorage |
| • Alpine Air Alaska: transportation | Girdwood |
| • American Power Systems: electrical | Anchorage |
| • Equipment Source Inc: electrical | Anchorage |
| • McGrady Steel and Supply: electrical | Anchorage |
| • Yukon Equipment: equipment rental | Anchorage |

Engineering

- | | |
|---|-----------|
| • HDR Alaska: engineering and construction mgmt. | Anchorage |
|---|-----------|

Professional Services

- | | |
|--|-----------|
| • JACS Consulting Services: programming | Anchorage |
| • Resource Data Inc.: programming | Anchorage |



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Funding Summary

thru September 30, 2013	Federal Funds including ARRC match	State FY 14 Funds	Total PTC funding thru 6/30/2014
Overall PTC Integration and Management	\$ 26,557,997	\$ 4,181,500	\$ 30,739,497
Office Segment	\$ 17,591,965	\$ 2,253,035	\$ 19,845,000
Locomotive Segment	\$ 3,663,749	\$ 3,813,210	\$ 7,476,959
Communications Segment	\$ 7,803,271	\$ 3,815,220	\$ 11,618,491
Wayside Device Monitoring	\$ 8,197,729	\$ 5,037,035	\$ 13,234,764
Total	\$ 63,814,711	\$ 19,100,000	\$ 82,914,711
Budget thru 6/30/2014	100%	100%	
Funds Committed	100%	21%	
Funds Spent	89%	1%	

2015 - 2018 PTC - Cash Flow Requirements (Unfunded)

	2015	2016	2017	2018	Total
Office, Comm and Locomotive Segments	\$ 10,784,110	\$ 7,717,322	\$ 5,756,240	\$ 4,556,240	\$ 28,813,912
Overall PTC Integration and Management	\$ 4,759,697	\$ 4,267,322	\$ 3,106,240	\$ 2,906,240	\$ 15,039,499
Locomotive Segment	\$ 3,420,509	\$ 800,000	\$ 1,300,000	\$ 300,000	\$ 5,820,509
Communications Segment	\$ 1,483,904	\$ 1,300,000	\$ 300,000	\$ 300,000	\$ 3,383,904
Office Segment	\$ 1,120,000	\$ 1,350,000	\$ 1,050,000	\$ 1,050,000	\$ 4,570,000
Wayside Segment	\$ 9,414,400	\$ 12,911,600	\$ 10,467,000	\$ 8,102,600	\$ 40,895,600
Monitoring CTC Signal and Switches	\$ 2,000,000				\$ 2,000,000
Dark Territory Manual Switch Monitoring	\$ 7,414,400	\$ 12,911,600	\$ 10,467,000	\$ 8,102,600	\$ 38,895,600
Total Funds Required	\$ 20,198,510	\$ 20,628,922	\$ 16,223,240	\$ 12,658,840	\$ 69,709,512

PTC Implementation Schedule

Original Estimated PTC Implementation Date:

December 2018

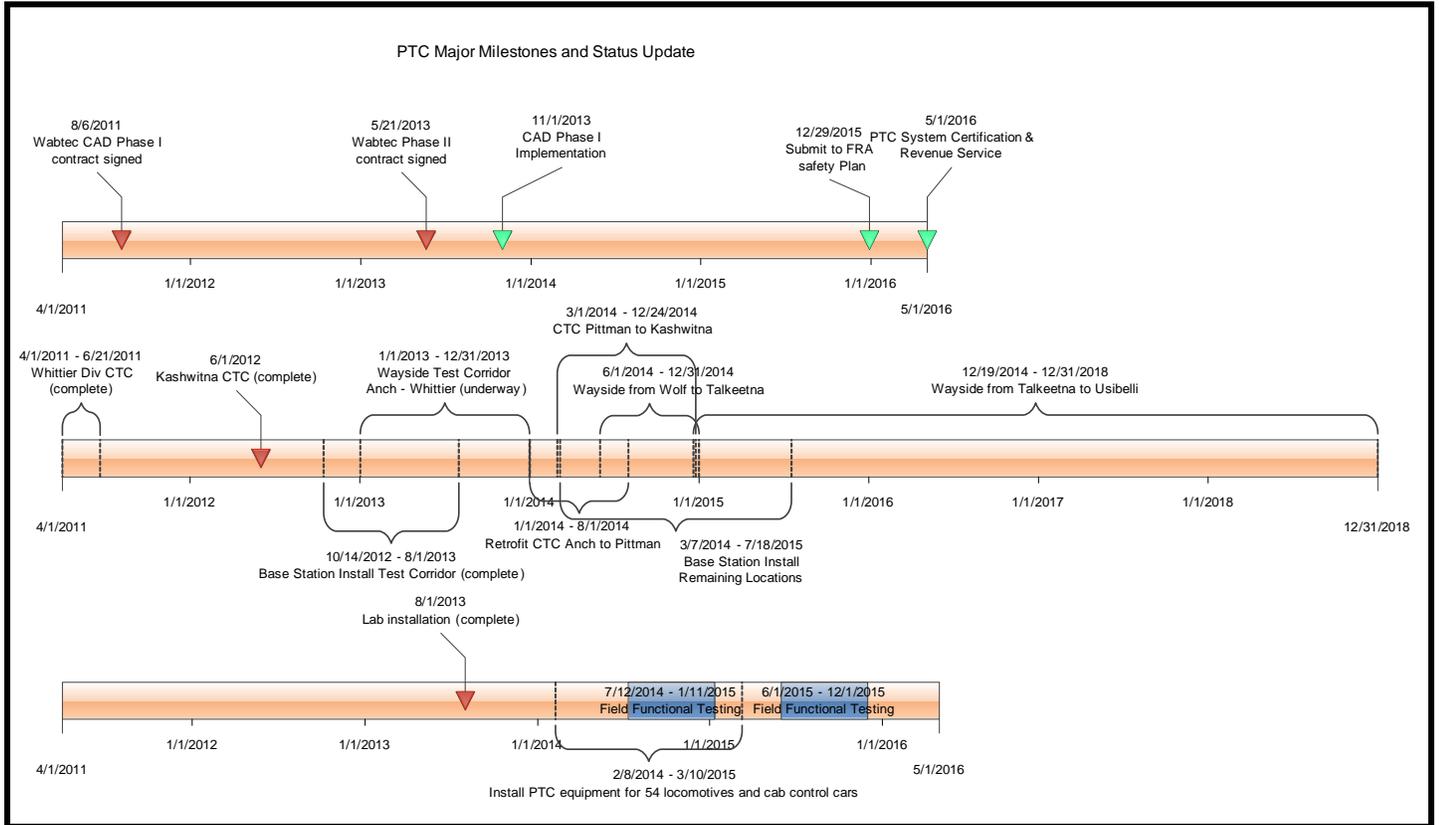
Current Estimated PTC Implementation Date:

December 2018



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Project Milestones





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ARRC Project Staff

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